34167
S/048/62/026/002/001/032
B104/B102

24.6200
AUTHORS: Dzhelepov, B. S., Medvedev, A. I., Uchevatkin, I. F., and Shestopalova, S. A.

TITLE: Spectrum of conversion electrons of the lutecium fraction with energies exceeding 1000 kev

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 2, 1962, 162-181

TEXT: The lutecium fraction was separated from a Ta target irradiated with 660-Mev protons for 2-4 hr. A new β-spectrometer with double focusing was used to study the spectrum in the 1020-3200 kev interval. Owing to the finite source thickness, the line half-widths were found to range between 0.22 and 0.29%. Lines of Lu^{169} (34 hr), Lu^{170} (2 days), Lu^{172} (6.7 days), and Lu^{174} were detected. The decay energies of the isotopes Yb^{169}, Lu^{171}, and Lu^{174}, contained in the preparation, were smaller than 1 Mev. The energies of lines were determined with the aid of

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of 2655, 2684, 2700, 2740, 2775, 2836, 2872, 2930, and 2955 kev. B. Playner et al. (Materialy III Soveshchaniya po neytronodefitsitnym izo pam, 1, 25, 32, Dubna, 1960) is mentioned. The authors thank the Board of Directors of the OIYaI and K. Ya. Gromov for supplying the sources, I. A. Pavlova, K. M. Shperling, V. D. Vitman, and A. A. Karan for assis with measurements. There are 17 figures, 3 tables, and 11 references: Soviet and 5 non-Soviet. The four most recent references to English-lan guage publications read as follows: Harmatz B., Handley T. H., Mihelich J. W., Phys. Rev., 119, 1345 (1960); Mihelich J. W., Harmatz B., Handley T. H., Phys. Rev., 123, 1758 (1961); Wilson R., Pool M., Phys. Rev., 118, 1067 (1960); Harmatz B., Handley T., Mihelich J., Phys. Rev., 114, 1082 (1959).

Table 1. Conversion electrons of Lu^{172}. Legend: (1) Consecutive number; (2) present paper; (3) conversion electron energy, kev; (4) relative intensity; (5) identification; (6) energy in kev.

Card 3/4

[redacted], B. S.; MEDVEDEV, A. I.; UCHEVATKIN, I. F.; SHESTOPALOVA, S. A.

"New Data on the Spectrum of Conversion Electrons of $Lu^{169,170}$ in the Energy Interval 1040-3250 keV."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

VNIIM (All Union Sci Res Inst Metrology)

[illegible], V. A.; VOINOVA, N. A.; DZHELEPOV, B. S.; MESHTER, A.; UCHEVATKIN, I. F.; [illegible]PALOVA, S. A.

"New Data on Conversion and the End-point Energies of Beta Spectra in the Decay of Ta^{182}."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

VNIIM, FTI (All-Union Sci Res Inst Metrology, Physico Technical Inst)

AP4010293 S/0048/64/028/001/0064/0071

AUTHOR: Dzhelepov.B.S.; Medvedev,A.I.; Uchevatkin,I.F.; Shestopalova, S.A.

TITLE: Measurement of the conversion coefficient of the 1095.0 keV transition in the decay of Lu^{172}. Calculation on the constants that determine the probabilities for transitions between $K = 3^+$ and $K = 0^+$ bands /Report, Thirteenth Annual Conference on Nuclear Spectroscopy held in Kiev, 25 Jan to 2 Feb 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.1, 1964, 64-71

TOPIC TAGS: conversion coefficient, multipole order, rotational band, lutetium 172, quadrupole moment, interband transition, spin factor, state mixing

ABSTRACT: Transition between the levels of different rotational bands form a distinctive class and hence are of interest in investigating nuclear structure. The 1095.0 and 913.8 keV transitions accompanying the decay of Lu^{172} are among the most intense transitions evinced in the decay of this nucleus and they take place between the $I^{\pi} = 3^+$ level of the $K = 3^+$ band and the 2^+ and 4^+ levels of the $K = 0$ rotational band. $\Delta I = 1$ (no) allows of M1 and E2 transitions; on the other hand, change of K by 3 units forbids both types of transitions, although not to the same

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calculations are carried out in more detail and the constants entering into the expressions for the transition probability are re-evaluated. On the basis of these, certain inferences are drawn regarding the probabilities and multipole orders of analogous transitions. In the concluding section the concept of "admixture quadrupole moments" is introduced and the values of these parameters for Yb^{172} are evaluated. "We take this opportunity to express our gratitude to A.Meshter, V.A.Balalyev, L.I.Shalayeva for assistance in the measurements, graduate student of Leningrad University A.S.Lenin for help in the measurements and processing the results, and N.M. Anton'yeva and V.B.Smirnov for making available the scintillation spectrometer for the measurements." Orig.art.has: 14 formulas, 4 tables and 1 figure.

ASSOCIATION: Vsesoyuzny*y nauchno-issledovatel'skiy institut metrologii im. D.I. Mendeleyeva (All-Union Scientific Research Institute of Metrology)

SUBMITTED: 00 DATE ACQ: 10Feb64 ENCL: 00

SUB CODE: NS NR REF SOV: 005 OTHER: 006

L 14489-65 EWT(m) DIAAP/AFWL/ASD(a)-5/SSD/ASD(f)-2/ASD(m)-3/ESD(gs)/ESD(t)
ACCESSION NR: AP4048642 S/0048/64/028/010/1704/1710

B

AUTHOR: Balalayev,V.A.; Voinova,N.A.; Dzhelepov,B.S.; Meshter,A.;Shestopalova,S.A.

19

TITLE: New data on the conversion electron spectrum of Ta^{182} in the energy region above 820 keV /Report, Fourteenth Annual Conference on Nuclear Spectroscopy held in Tbilisi 14-22 Feb 1964/

SOURCE: AN SSSR. Izv.Seriya fizicheskaya, v.28, no.10, 1964, 1704-1710

TOPIC TAGS: nuclear physics, beta spectrum, electron conversion, nuclear spectroscopy, tantalum

ABSTRACT: The conversion electron spectrum of 115 day tantalum 182 was investigated with a double $\pi\sqrt{2}$ focusing β-spectrometer described elsewhere by one of the authors (S.A.Shestopalova,Izv.AN SSSR,Ser.fiz.25,1302,1961). The measurements were undertaken in order to record the spectrum at energies above 1220 keV, where it has not previously been adequately investigated. The source was a tantalum film vacuum evaporated onto an aluminum backing. It was activated with thermal neutrons and was examined four months later. Thirty eight conversion lines with energies from 822 to 1387 keV were detected and identified; 20 of these had not previously been reported.

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The observed lines and their relative intensities are tabulated, and the data are also presented graphically with the statistical errors shown. The relative intensities are compared with those obtained by V.S.Gvozdev et al.(Izv.AN SSSR,Ser.fiz. 24,1444,1960), S.S.Vasilenko et al. (Izv.AN SSSR,Ser.fiz.25,61,1961), L.N.Kondrat'yev et al. (Preprint ITEF 494,1963), and S.V.Starodubtsev et al. (Zhur.eksp.i teor. fiz.45,921,1963). The present data, except for three lines, are in very good agreement with those of Kondrat'yev et al., and they are in satisfactory agreement with those of Gvozdev et al. and with those of Vasilenko et al. There are large unsystematic deviations from the relative intensities reported by Starodubtsev et al.

"The authors take the occasion to express their deep gratitude to coworkers G.S. Novikov of the LGU and V.V.Pavlov of the FTI for assistance in preparing the source, to coworkers A.I.Medvedev and L.I.Shalayeva of the VNIIM for assistance in the measurements, and to student-diplomatist A.B.Andrezen of the LPI for assistance in reducing the data." Orig.art.has: 9 figures and 1 table.

2

L 14489-65
ACCESSION NR: AP4048642

ASSOCIATION: Vsesoyuzny*y nauchno-issledovatel'skiy institut metrologii im. D.I. Mendeleyeva (All-Union Scientific Research Institute of Metrology); Fiziko-tekhnicheskiy institut im.A.F.Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences, SSSR)

SUBMITTED: 00 ENCL: 00

SUB CODE: NP NR REF SOV: 008 OTHER: 003

3/3

BALALAYEV, V.A.; D'YACHENKOV, B.S.; MESHKER, A.; CHISTOPALOVA, S.A.

Spectrum of conversion electrons from Eu^{146} in the energy range of 750 — 1550 Kev. Izv. AN SSSR. Ser. fiz. 29 no.7:1112-1120 Jl '65. (MIRA 18:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im. D.I.Mendeleyeva.

BALALAYEV, V.A.; VOINOVA, N.A.; MIKHLEYEV, B.S.; MOSKVIN, L.N.; SHESTOPALOVA, S.A.

On the β-decay of Ta^{182} with an energy above 600 Kev. Izv. AN SSSR. Ser.fiz. 30 no.1:126-131 Ja '66. (MIRA 19:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im. D.I.Mendeleyeva i Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.

L 25761-66 JD/JG

ACC NR: AP6016393 SOURCE CODE: UR/0048/65/029/007/1112/1120

AUTHOR: Balalayev, V. A.; Dzhelepov, B. S.; Meshter, A.; Shestopalova, S. A.

ORG: All-Union Scientific Research Institute of Metrology im. D. I. Mendeleyev (Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii)

TITLE: Conversion electron spectrum of Eu sup 146 in the energy range 750-1550 kev

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 7, 1965, 1112-1120

TOPIC TAGS: europium, electron spectrum

ABSTRACT: This article is a complete presentation of results from an experiment reported on earlier in part at the VII Congress at Dubna in 1964. A segment of the spectrum of Eu^{146} conversion electrons was studied in the energy range from 750 to 1550 kev. The article is primarily made up of graphs and tables representing the data from the experiment with a brief description of the setup and some discussion of the results. It was concluded that a) all the conversion lines observed by other researchers were observed in the present experiment; b) 25 new transitions were discovered; c) all the transition energies in this range were more precisely determined. The authors thank Zh. T. Zhelev for his assistance in the receipt of the sources; L. N. Moskvin for the cleansing of the preparations; and I. F. Uchevatkin, V. D. Vitman, A. I. Medvedev and L. A. Shalayeva for their assistance with the measurements. Orig. art. has: 8 figures and 1 table. [JPRS]

SUB CODE: 20 / SUBM DATE: none / ORIG REF: 006 / OTH REF: 001

Card 1/1 CC

L 26656-66 EWT(m) DIAAP

ACC NR: AP6017117 SOURCE CODE: UR/0048/65/029/012/2205/2224

AUTHOR: Balalayev, V. A.; Dzhelepov, B. S.; Medvedev, A. I.; Uchevatkin, I. F.; Shestopalova, S. L.

ORG: All Union Scientific Research Institute of Metrology, im. D. I. Mendeleyev (Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii)

TITLE: New data on Ce sup 135 decay /This paper was presented at the 15th Annual Conference on Nuclear Spectroscopy and the Structure of the Atomic Nucleus, held in Minsk from 25 January to 2 February 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 12, 1965, 2205-2224

TOPIC TAGS: radioactive decay, cerium, electron spectrum, electron energy, radioisotope, gamma spectrum, electron transition

ABSTRACT: To verify the electron transitions of Ce^{135} having energies of 87 ± 1 and 120 ± 1 kev, a new study was made of the conversion electron spectra of the isotope in the electron energy range from 42 to 85. Earlier studies had included energies up to 2660 kev, but since the energy of Ce^{135} decay can reach 28000 kev, this study was extended from 2660 to 3090 kev. The results obtained are compared with those of K. Takahashi, et al., J. Phys. Soc. Japan, Vol. 19, No. 11, p 2014 (1964) in a table, and a systematic discrepancy is noted: the Japanese energy measurements are consistently lower (ranging from 0.3 to 2.7%) than those obtained in this paper.

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In the remainder of the paper the authors treat the relative intensities in the gamma-ray spectrum of Ce^{135}, determine the multipolarity of the transitions in La^{135}, plot curves for the photoelectron spectrum of Ce^{135}, tabulate transition intensities for the decay of Ce^{135}, tabulate transition intensities for the decay of $Ce^{135} \rightarrow La^{135}$, calculate 35 energy coincidences among the transitions between the excited states of La^{135}, discuss the decay scheme of Ce^{135}, and analyze the balance of intensities over the levels of La^{135}. The authors thank Ye. Ye. Bondar', A. Meshter, and L. I. Shalayev for assistance in making the measurements; K. Ya. Gromov and Zh. T. Zhelev for supplying the sources; N. A. Lebedev for the chromatographic separations of fractions; L. K. Pekar for useful discussions, and N. N. Kolesnikov for calculating the mass difference of the nuclei $Ce^{135} \rightarrow La^{135}$. Orig. art. has: 4 figures and 6 tables. [JPRS]

SUB CODE: 20 / SUBM DATE: none / ORIG REF: 014 / OTH REF: 002

L 07155-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG
ACC NR: AP7001027 SOURCE CODE: UR/0048/66/030/001/0126/0131

AUTHOR: Balalayev, V. A.; Voinova, N. A.; Dzhelepov, B. S.; Moskvin, L. N. and Shestopalova, S. A.

ORG: All-Union Scientific Research Institute of Metrology im. D. I. Mendeleyev (Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii); Physicotechnical Institute im. A. F. Ioffe AN SSSR (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Beta decay of ta sup 182 with energy above 600 kev (Paper presented at the 2nd All-Union Symposium on the Physics of thin Ferromagnetic Films; Irkutsk, 10-15 July 1964)

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 1, 1966, 126-131

TOPIC TAGS: radioactive decay, tantalum, beta radiation

ABSTRACT: In a previous paper the authors were the first to discover a continuous background in the 820-kev region for the beta decay of ta sup 182. This prompted a continuation of the work to investigate the hard beta radiation in the 1500-kev region of a stronger Ta sup 182 source. Results are pletted in curves, tabulated, and compared with results of other authors. The authors thank A. Meshter, If. F. Uchevatkin, and A. I. Medvedev for assistance in the taking of the measurements. I. F. Uchevatkin also took part in the operation and discussions of the original experimental data. The authors further thank G. M. Bukat for setting up the program for the electronic calculating machine. Orig. art. has: 3 figures and 2 tables.

Card 1/1 [NPRS; 35,435] SUB CODE: 18 / SUBM DATE: none / ORIG REF: 003 / OTH REF: 003

ACC NR: AT6027750 SOURCE CODE: UR/0048/66/030/008/1314/1321

AUTHOR: Dzhelepov, V. A.; Mikhelopov, V. S.; Medvedev, A. I.; Uchevatkin, I. F.; [illegible]

ORG: All-Union Scientific Research Institute of Metrology im. D. I. Mendeleyev (Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii)

TITLE: Multipole order of the transition with 1095-kev energy in Yb^{172}

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 8, 1966, 1314-1321

TOPIC TAGS: radioactive decay, lutetium

ABSTRACT: In recent years this matter has been the subject of sharp discussion. Steudbeck, et al. (Phys. Rev., 130, 1901 (1963)) claim that the multipole order of the transition with 1095-kev energy in Yb^{172} is M1 + 5% E2, whereas Guenther et al. (Nucl. Phys., 61, 65 (1965)) conclude that it is M1 + 5%E3 + 0.2% E2); both these findings diametrically contradict the authors' earlier findings (Dzhelepov et al. Izv. AN SSSR, Ser. Fiz., 28, 64 (1964)) that the multipole order of this transition is either E + 2 (5-5-7)% M1 or E1 + (15+ 1)% M2. To clarify this matter a new method of investigation was adopted: a Lu^{171} + [illegible] preparation was employed, since one of the transitions occurring in Yb^{171} during the decay of Lu^{171} has a known multipole order (with reference to the 740-kev transition). The results obtained were found to be in virtual agreement with the earlier findings of the authors:

Card 1/2 0125 1623

ACC NR: A7002793

K1095 = (2.5 ± 0.4) 10-3. It is not yet clear why Stautberg et al. and Guenther et al. drew other conclusions from their measurements of angular correlation, but there cannot be any doubt as to the quantity K1095. Orig. art. has: 2 figures 1 formula and 3 tables. [JPRS: 39,040]

SUB CODE: 18,20 / SUBM DATE: none / ORIG REF: 006 / OTH REF: 006

L 36510-65

UR/0239/64/050/007/0812/0819

ACCESSION NR: AP5010543

AUTHOR: Shestopalova, S. K.

TITLE: Unconditioned reflex salivation in papio baboons (papio hamadryas)

SOURCE: Fiziologicheskiy zhurnal SSSR, v. 50, no. 7, 1964, 812-819

TOPIC TAGS: endocrinology, enzyme, experiment animal

ABSTRACT: Secretion of saliva from the parotid gland in the fasting Papio baboon occurs continuously. Amylolytic activity of "spontaneous" saliva remains constant during an extended period of observation (up to 2 months). The saliva released in the fasting animal from the parotid gland exhibits high amylolytic activity, which is higher than that of "spontaneous" saliva of the submaxillary gland. An intimate relationship exists between the kind of food matter and the quantitative and qualitative composition of saliva: a) when the same foodstuff is eaten, an equal amount of saliva with identical amylolytic activity is secreted; b) secretion of saliva with new properties corresponds to each new foodstuff; c) while secretion of saliva

Card 1/2

from the submaxillary gland shows this relationship to a lesser extent; d) amylolytic activity of "spontaneous" saliva of the parotid gland increases sharply when given foodstuffs are eaten, while the enzymatic activity of "spontaneous" saliva of the submaxillary gland is appreciably reduced. Secretion of the liquid portion of saliva and its enzyme amylase both when fasting and when different foods are eaten occurs independently of each other. Orig. art. has: 4 tables, 1 graph.

ASSOCIATION: Laboratoriya fiziologii i patologii vysshey nervnoy deyatel'nosti Instituta eksperimental'noy patologii i terapii AMN SSSR, Sukhumi (Laboratory of Physiology and Pathology of Higher Nervous Activity, Institute of Experimental Pathology and Therapy, AMN SSSR)

SUBMITTED: 17Jul62

ENCL: 00

SUB CODE: LS

NO REF SOV: 009

OTHER: 000

JPRS

Card 2/2

USSR

539.166.08

8604. A γ-spectrometer with improved focusing. B. S. DZHELEPOV, N. N. ZHUKOVSKII, A. A. KARAMYAN AND S. S. SHESTOPALOVA. *Izv. Akad. Nauk SSSR, Ser. Fiz.*, 17, No. 4, 518–20 (1953) *In Russian.*

Improved focusing in a spectrometer of the type of Abstr. 3377 (1950) and 6433 (1951) achieved by using an inhomogeneous magnetic field was tested by determining the characteristics of the 1·17 and 1·33 MeV lines of the Co^{60} spectrum. W. J. SWIATECKI

SHESTOPALOVA, V.N., kand.tekhn.nauk

Frequency relay. Elek.sta. 28 no.12:66-67 D '57. (MIRA 12:3)
(Electric relays)

24(0); 5(4); 6(2) PHASE I BOOK EXPLOITATION SOV/2215

Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii imeni D.I. Mendeleyeva

Referaty nauchno-issledovatel'skikh rabot; sbornik No.2 (Scientific Research Abstracts; Collection of Articles, Nr 2) Moscow, Standartgiz, 1958. 139 p. 1,000 copies printed.

Additional Sponsoring Agency: USSR. Komitet standartov, mer i izmeritel'nykh priborov.

Ed.: S. V. Resnetina; Tech. Ed.: M. A. Kondrat'yeva.

PURPOSE: These reports are intended for scientists, researchers, and engineers engaged in developing standards, measures, and gages for the various industries.

COVERAGE: The volume contains 123 reports on standards of measurement and control. The reports were prepared by scientists of institutes of the Komitet standartov, mer i izmeritel'nykh priborov pri Sovete Ministrov SSSR (Commission on Standards, Measures, and Measuring Instruments under the USSR Council of Ministers). The participating institutes are: VNIIM - Vsesoyuznyy nauchno-issledovatel'skiy metrologii imeni D.I. Mendeleyeva (All-Union Scientific Research Institute of Metrology imeni D.I. Mendeleyev) in Leningrad; Sverdlovsk branch of this Institute; VNIIK - Vsesoyuznyy nauchno-issledovatel'skiy institut komiteta standartov, mer i izmeritel'nykh priborov (All-Union Scientific Research Institute of the Commission on Standards, Measures, and Measuring Instruments), located from MGIMIP - Moskovskiy gosudarstvennyy institut mer i izmeritel'nykh priborov (Moscow State Institute of Measures and Measuring Instruments) October 1, 1955; VNIIFTRI - Vsesoyuznyy nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy (All-Union Scientific Research Institute of Physicotechnical and Radio-engineering Measurements) in Moscow; KhGIMIP - Khar'kovskiy gosudarstvennyy institut mer i izmeritel'nykh priborov (Khar'kov State Institute of Measures and Measuring Instruments); and NGIMIP - Novosibirskiy gosudarstvennyy institut mer i izmeritel'nykh priborov (Novosibirsk State Institute of Measures and Measuring Instruments). No personalities are mentioned. There are no references.

Aleksandrov, V.A., I.L. Morozova, L.A. Orlova, and Yu. V. Shmatovala (Sverdlovsk Branch of VNIIM) Studying a Potentiometric Method for the Determination of Manganese and Chromium and a Hydrogen Method for the Determination of Sulfur in Standard Chemical Composition Samples of Cast Iron and Steel 116

Aleksandrov, V.A., I.L. Morozova, and L.G. Plotnikovskaya (Sverdlovsk Branch of VNIIM). Studying Methods for the Determination of Small Amounts of Carbon in Ferrous Metals 116

Morozova, I.L., and L.G. Plotnikovskaya (Sverdlovsk Branch of VNIIM). Finding the Most Accurate Method for the Determination of Sulfur in Ferrous Metals 117

Plotnikovskaya, L.G., I.L. Morozova, L.A. Orlova, and Yu. V. Shmatkova (Sverdlovsk Branch of VNIIM). Studying Chemical Analysis Methods for the Determination of Copper, Zinc, and Manganese in Copper-Zinc Alloys 118

Malkova, E.M., N.I. Gutkina, and G.A. Tsiplukhova (Sverdlovsk

24(0); 5(4); 6(2) PHASE I BOOK EXPLOITATION SOV/2215

Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii imeni D.I. Mendeleyeva

Referaty nauchno-issledovatel'skikh rabot; sbornik No.2 (Scientific Research Abstracts; Collection of Articles, Nr 2) Moscow, Standartgiz, 1958. 139 p. 1,000 copies printed.

Additional Sponsoring Agency: USSR. Komitet standartov, mer i izmeritel'nykh priborov.

Ed.: S. V. Rosnetsina; Tech. Ed.: M. A. Kondrat'yeva.

PURPOSE: These reports are intended for scientists, researchers, and engineers engaged in developing standards, measures, and gages for the various industries.

COVERAGE: The volume contains 128 reports on standards of measurement and control. The reports were prepared by scientists of the Komitet standartov, mer i izmeritel'nykh priborov pri Sovete Ministrov SSSR (Commission on Standards, Measures, and Measuring Instruments under the USSR Council of Ministers). The participating institutes are: VNIIM - Vsesoyuznyy nauchno-issledovatel'skiy metrologii imeni D.I. Mendeleyeva (All-Union Scientific Research Institute of Metrology Imeni D.I. Mendeleyev) in Leningrad; Sverdlovsk branch of this institute; VNIIM - Vsesoyuznyy nauchno-issledovatel'skiy institut komiteta standartov, mer i izmeritel'nykh priborov (All-Union Scientific Research Institute of the Commission on Standards, Measures, and Measuring Instruments), merged from MGIMIP - Moskovskiy gosudarstvennyy institut mer i izmeritel'nykh priborov (Moscow State Institute of Measures and Measuring Instruments) October 1, 1955; VNIIFTRI - Vsesoyuznyy nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy (All-Union Scientific Research Institute of Physicotechnical and Radio-engineering Measurements) in Moscow; KhGIMIP - Kharkovskiy gosudarstvennyy institut mer i izmeritel'nykh priborov (Kharkov State Institute of Measures and Measuring Instruments); and NGIMIP - Novosibirskiy gosudarstvennyy institut mer i izmeritel'nykh priborov (Novosibirsk State Institute of Measures and Measuring Instruments). No personalities are mentioned. There are no references.

Card 22/27

SHESTOPALYUK, A., inzh.-podpolkovnik; KUPERSHMID, I., inzh.

Movable electric power station. Av.i kosm. 46 no.1:84 Ja '64.
(MIRA 17:3)

GRIGOROV, N.L.; SHESTOPEROV, B.Ya.; SOBINYAKOV, V.A.; PODGURSKAYA, A.V.

Interaction of 10^{12}--10^{13} ev energy particles with light atomic nuclei. Zhur. eksp. i teor. fiz. 33 no.5:1099-1109 N '57. (MIRA 11:3)

1. Moskovskiy gosudarstvennyy universitet.
(Cosmic rays) (Ionization chambers)
(Collisions (Nuclear physics))

K-3

USSR/Forestry - Dendrology

Abs Jour : Ref Zhur - Biol., No 5, 1958, 20126

Author : Shestoperov, G.P., Fadeyev, A.D.

Inst : Kuybyshev Agricultural Institute.

Title : The Structure of the Skeletal Part of the Root Systems of Betula Verrucosa, the Chinese Elm, the Golden Currant and Black Currant in Chernozem Soils.

Orig Pub : Izv. Kuybyshevsk, s.-kh. in-ta, 1957, 12, 103-112.

Abstract : The investigations were made in plantings on the left bank of the Volga in Kuybyshevskaya Oblast'. It was established that the birch Betula verrucosa Ehr. and the Chinese elm form powerful root systems, develop well in both horizontal and vertical directions, and are distinguished for their wind resistance in chernozem soils.

Card 1/2

K-3

USSR/Forestry - Dendrology.

Abs Jour : Ref Zhur - Biol., No 5, 1958, 20126

The golden and black currants on chernozem soils formed compact root systems, penetrating in the 2-3 summer's growth to a depth of 100-120 cm.

Card 2/2

K

COUNTRY : USSR

CATEGORY : Forestry. Forest Cultures.

ABS. JOUR. : [illegible], No. 1959, No. [illegible]

AUTHOR : [illegible], G. [illegible]; [illegible], S.P.; [illegible]kov, M.N.

INST. : [illegible]

TITLE : [illegible] of the [illegible] Area.

ORIG. PUB. : Izv. [illegible] In-ta, 1958, 13, 231-243

ABSTRACT : [illegible] C[illegible] deciduous [illegible]

CARD: 1/2

54

ABS. JOUR. : RZhBiol., No. 5, 1959, No. 19913

AUTHOR :
INST. :
TITLE :

ORIG. PUB. :

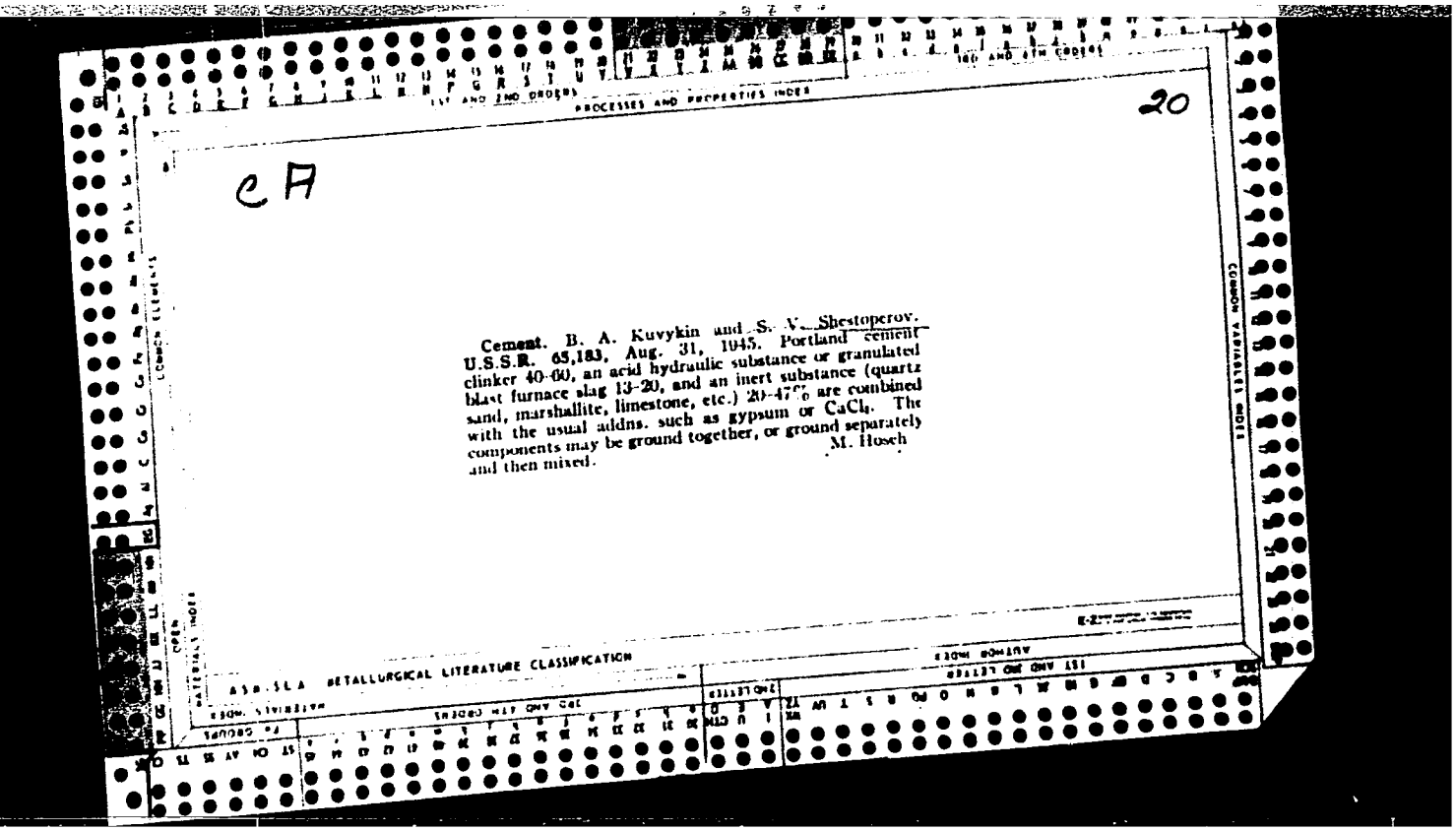
ABSTRACT : higher commodity value and wood resources. It is recommended that the common vine be used in forest cultures on the chernozem soils of the left bank of the Volga.

CARD: 2/2

SHESTOPEROV, G.P.

Spot seeding of oak in shelterbelts at the experimental farm of the Kuybyshev Institute of Agriculture. Agrobiologiia no.2:258-267 Mr-Ap '62. (MIRA 15:4)

1. Kuybyshevskiy sel'skokhozyaystvennykh institut.
(Kuybyshev region--Oak) (Windbreaks, shelterbelts, etc.)

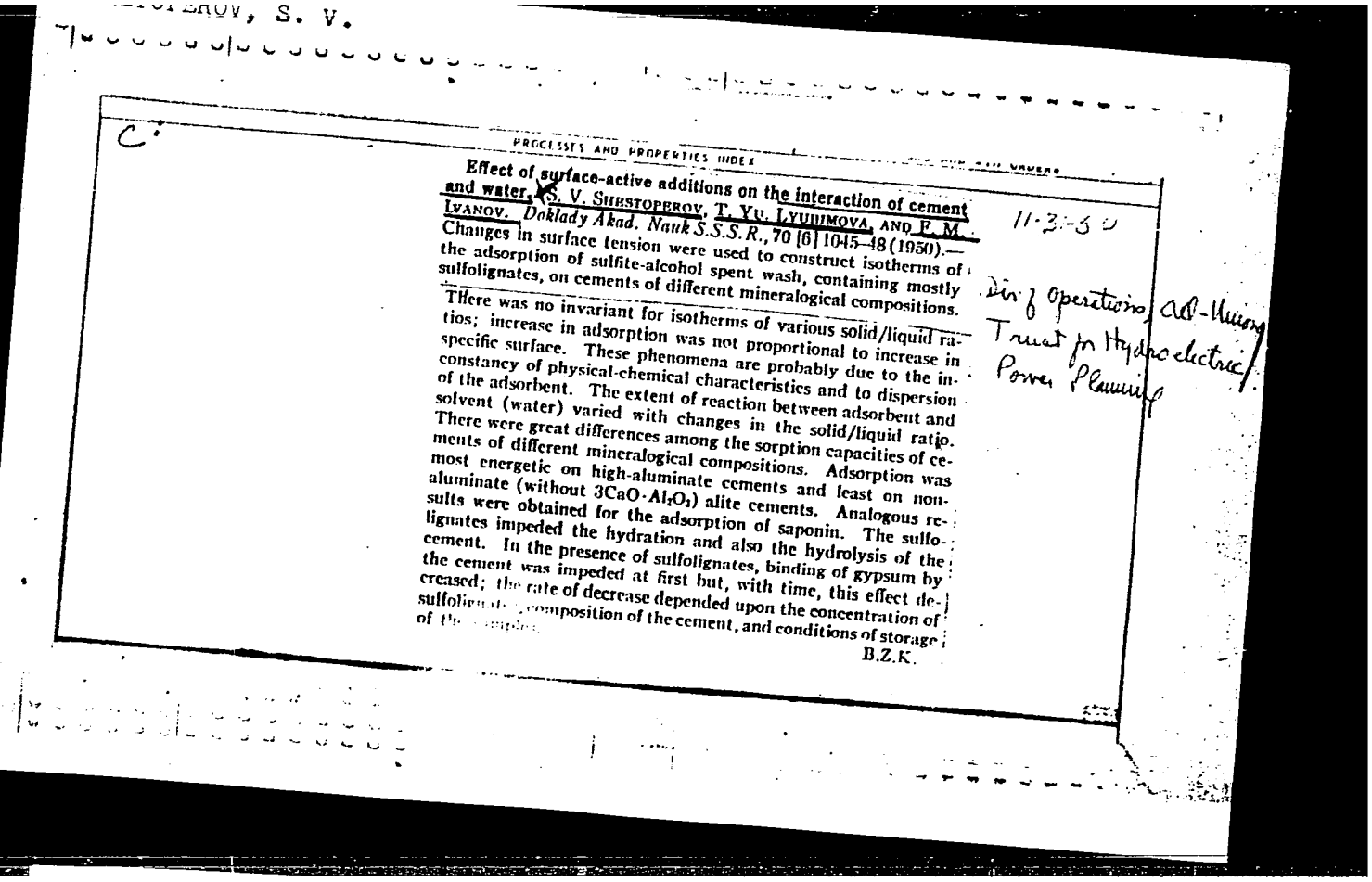


CA

20

Cement. B. A. Kuvykin and S. V. Shestoperov. U.S.S.R. 65,183, Aug. 31, 1945. Portland cement clinker 40-60, an acid hydraulic substance or granulated blast furnace slag 13-20, and an inert substance (quartz sand, marshallite, limestone, etc.) 20-47% are combined with the usual addns. such as gypsum or $CaCl_2$. The components may be ground together, or ground separately and then mixed.

M. Hosch



...IKOV, S. V.

C.

PROCESSES AND PROPERTIES INDEX

Effect of surface-active additions on the interaction of cement and water. S. V. Shestoperov, T. Yu. Lyubimova, and F. M. Ivanov. *Doklady Akad. Nauk S.S.S.R.*, 70 [6] 1045–48 (1950).—Changes in surface tension were used to construct isotherms of the adsorption of sulfite-alcohol spent wash, containing mostly sulfolignates, on cements of different mineralogical compositions. There was no invariant for isotherms of various solid/liquid ratios; increase in adsorption was not proportional to increase in specific surface. These phenomena are probably due to the inconstancy of physical-chemical characteristics and to dispersion of the adsorbent. The extent of reaction between adsorbent and solvent (water) varied with changes in the solid/liquid ratio. There were great differences among the sorption capacities of cements of different mineralogical compositions. Adsorption was most energetic on high-aluminate cements and least on non-aluminate (without $3CaO \cdot Al_2O_3$) alite cements. Analogous results were obtained for the adsorption of saponin. The sulfolignates impeded the hydration and also the hydrolysis of the cement. In the presence of sulfolignates, binding of gypsum by the cement was impeded at first but, with time, this effect decreased; the rate of decrease depended upon the concentration of sulfolignates, composition of the cement, and conditions of storage of the [illegible]

B.Z.K.

11-3-50

Dir of Operations, AA-Union Trust for Hydroelectric Power Planning

SHESTOPEROV, S. V.

"About the Technical Requirements of Cement in the Great Projects of Cummunism," News of the Acad. of Scis. of the Soviet Union, 1952.

SHESTOPEROV, S.V., kandidat tekhnicheskikh nauk; IVANOV, F.M., kandidat tekhnicheskikh nauk; ZASHCHEPIN, A.N., kandidat tekhnicheskikh nauk; LYUBIMOVA, T.Yu., kandidat khimicheskikh nauk; GRADISHCHEV, N.Ye., redaktor; KOVALIKHINA, N.F., tekhnicheskiy redaktor

[Concrete with plasticiser agents] TSementnyi beton s plastifitsiruiushchimi dobavkami. Moskva, Izd-vo dorozhno-tekhn.lit-ry Gushosdora MVD SSSR, 1952. 105 p. [Microfilm] (MLRA 9:3)
(Concrete)

SHESTOPEROV, S. V.

Cement - Standards

Technical specifications of cement for the great construction projects of communism. Izv. AN SSSR Otd. tekh. nauk, No. 6, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

1. [illegible], [illegible], [illegible]

2. USSR (600)

4. Cement

7. Action of plasticizers on cement on various mineralogical composition. Tsement 18 no. 6, 1952.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

USSR

Relation between mechanical characteristics of $3CaO \cdot Al_2O_3 \cdot 6H_2O$ and the moisture of the material. S. V. SHESTOPEROV AND T. YU. LYUBIMOVA. *Doklady Akad. Nauk S.S.S.R.*, 86, [6] 1187-90 (1952).—The mechanical properties of concentrated suspensions of $C_3A \cdot 6H_2O$ are determined by the relative amount of the dispersing medium(water). In the absolute dry condition, the material is characterized by the greatest strength, hardness, and monolithic structure. During adsorption hydration in moist air, the strength and hardness drop; the material softens from capillary condensation, and monolithic structure is destroyed by storage in water. B.Z.K.

[illegible], . . V.

Cement

Practical application of the achievements of Soviet scientists and engineers in the field of cement and concrete technology. Izv. AN SSSR. Otd. tekh. nauk No. 1, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953. Unclassified.

SHESTOPEROV, Sergey Vladimirovich.

Council of Roads (?), Sci Res Inst of the Min of Automobile Transport and Highways. Academic degree of Doctor of Technical Sciences, based on his defense, 6 April 1955, in the Council of the Central Sci Res Inst of Industrial Constructions, of his dissertation entitled: "Longevity of Concrete."

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no. 15, 25 June 55, Byulleten' MVO SSSR, No. 15, Aug 56, Moscow, pp. 5-24, Uncl. JPRS/NY-537

SHESTOPEROV, Sergey Vladimirovich; IVANOV, F.M., redaktor; MAL'KOVA, N.V., tekhnicheskiy redaktor.

[Durability of concrete] Dolgovechnost' betona. Moskva, Nauchno-tekhn.izd-vo avtotransportnoi lit-ry, 1955. 478 p. (MLRA 9:1)
(Concrete)

AID P - 1753

Subject : USSR/Hydraulic Engineering Construction

Card 1/2 Pub. 35 - 12/21

Author : Shestoperov, S. V. and Ivanov, F. M.

Title : On causes of deterioration of concrete in the upstream slope of a reinforced concrete dam

Periodical : Gidr. stroi., v.24, no.2, 37-38, 1955

Abstract : The appearance of horizontal parallel cracks in the top section of the piers and upstream slope due to severe frosts (-40°C) on a dam built during the war is discussed. Causes for this unusual type of weathering of concrete made of slag portland cement are believed to be: saturation of concrete with water under pressure, aided by the solid ice cover which prevents the drying of the surface, capillary water penetration and the squeezing out of the air. Research and study of possible methods of curing and protecting concrete in cold weather are recommended.

USSR/Chemical Technology. Chemical Products and Their Application -- Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5294

Author: Shestoperov, S. V., Ivanov, F. M.

Institution: None

Title: Increasing the Sulfate-Stability of Portland Cement

Original Publication: Tsement, 1956, No 3, 20-22

Abstract: It has been ascertained, experimentally, that it is possible to increase substantially the sulfate-stability of Portland cement mortars by preparing them from finely ground cement with increased additions of gypsum. The binder was prepared from clinkers of different mineralogical composition, containing (in %): C_3S 33-58, C_2S 33-19, C_3A 11-5, C_4AF 19-16. Fineness of ground clinker 3,000, 4,500 and 7,000 cm^2/g (determined with the Giprotsement apparatus). Addition of gypsum amounted to 5-20%. Samples of plastic mortar prepared from finely ground sulfate-unstable clinker, containing 11% C_3A,

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SHESTOPEROV, S.V., doktor tekhnicheskikh nauk; BOGIN, N.M., kandidat tekhnicheskikh nauk; IVANOV, G.S., inzhener; LUKICHEV, N.A., inzhener; DAVYDOV, L.S., inzhener; GROMOV, V.S., inzhener; POPOV, N.A., inzhener; ZHURAVLEV, G.M., master.

Vibrators for making wire reinforced ties on stands. Transp.stroi. 6 no.3:12-14 Mr '56. (MLRA 9:7)
(Railroads--Ties, Concrete)

97-58-1-4/12

AUTHOR: Shestoperov, S.V. Dr. of Technical Science, Professor
Panfilova, L.I. Candidate of Technical Science

TITLE: Problems Concerning the Thermal Curing of Concrete (K voprosu termoobrabotki betona.)

PERIODICAL: Beton i Zhelezobeton. 1958. No. 1 Pp 19-22.

ABSTRACT: This article carries further the discussion on improved methods of steam curing of concrete and reinforced concrete products begun in this journal 1957 No. 12. The strength of the products made from stiff concrete mixes differs considerably from the strength of products made from more plastic mixes. This is also true if curing is extended to 4 hours at a temperature of 60°. When products are cured in temperatures above 60°C in many cases for 8 hours duration isothermic curing is inexpedient. The same could be said of temperatures of more than 80° C for a duration of more than four hours. Tests carried out show that the use of concrete mixes with a water/cement ratio equal to 0.35 and a duration of isothermic curing of 6-8 hours for products made from vibro-ground cement (600 or more) could result in the products having a crushing strength in compression of 75-80% of testing samples hardening under normal conditions for 28 days. It was considered advisable that investigations regarding curing should be intensified to

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Problems Concerning the Thermal Curing of Concrete

find out details of increase in the strength of concrete covering cements of wide mineralogical and chemical compositions. Existing recommendations on the curing of concrete are not perfect and need further study. Investigations show that a curing of products made from concrete mixes with a minimum quantity of water results in a stronger concrete than products based on mixes with a high water content. This will be proved in practice and a large saving will be achieved especially in curing during the winter periods and large quantities of cement will also be saved. Instructions on the setting of concrete are given in Instruktsii po proparivaniyu betonnykh i zhelezobetonnykh izdeliy na zavodakh i poligonakh — Instructions on the Curing of Concrete and Reinforced Concrete Products in Factories and Concreting Yards - I 206-55 MSPMKhP A publication dealing with stiff concrete mixes is Ukazaniya po primeneniyu zhestkikh betonnykh smesey v promyshlennosti zhelezobetonnykh izdeliy (Instructions .....)

Problems Concerning the Thermal Curing of Concrete

on the Use of Stiff Concrete Mixes in the Production of Reinforced Concrete Products" - (U144 - 55) (MPSM-MSPMKhP). Information on the curing of high quality concrete products with low water content was obtained by TsNIIS of the Mintransstroy in TsNIPS (Dr. of Technical Science V.N. Sizov). Petrographical formation of cements according to Candidate of Technical Science O.M. Astreyeva are given in Table 1 and Table 2 show results of tests carried out with these cements. The cement had been tested to comply with Gost 310-41. Curing of testing samples was carried out in the TsNIIPS laboratories. Table 3 gives results of the crushing tests on concrete samples hardened under normal conditions. Table 4 shows that of testing samples hardening at curing temperatures of 60° if the water / cement ratio is increased from 0.29-0.35 the strength decreases approximately to 66% (100% is related to a sample hardening under normal conditions for 28 days.) Table 5 gives results of tests on samples prepared from water/cement ratios 0.31 and 0.35 at various thermal conditions and durations of curing. Table 6 shows that the strength of test cubes after curing at 60°C when the water

Problems Concerning the Thermal Curing of Concrete.

content increases the strength decreases. Table 7 shows that when fine-ground cement is used the curing could be reduced to 4 - 8 hours. There are 7 Tables.

Card 4/4

1. Concrete--Processing 2. Concrete--Temperature factors
3. Steam--Applications 4. Concrete--Mechanical properties

SOV/97-58-10-3/17

AUTHOR: Shestoperov, S.V., Dr. of Technical Sciences

TITLE: The Manufacture of Rapid-Hardening, Durable and Effective Concretes for Precast Reinforced Concrete Constructions (K voprosu proizvodstva bystrotverdeyushchikh, dolgovechnykh i effektivnykh betonov dlya sbornykh zhelezobetonnykh konstruktsiy)

PERIODICAL: Beton i zhelezobeton, 1958, Nr 10, pp 368-372 (USSR)

ABSTRACT: The new physical and chemical theory of concrete put forward by N.V. Mikhaylov, Doctor of Technical Sciences, is discussed in this article. It is based on the assumption that it is possible to obtain 100% activity from cement used in concrete prepared and cast in this new way (see also Mikhaylov in Beton i zhelezobeton, 1958, Nr 9). At the Fourth Session of ASiA SSSR Mikhaylov stressed the significance of the content of calcium aluminate (C_3A) in cement. The author of this article does not agree that investigations into economy in cement should be confined to the conditions of crystallization of C_3A, and this view is also supported in works by V.N. Yung, S.D. Okorokov and Yu.M. Butt. The presence of belite (C_2S) affects the speed of hardening of cement. An analysis of fifteen-

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year old concrete showed that belite reacts very little with water. Size of grains of cement has a direct effect on the process of hardening. This is also proved in a book by V.N. Yung (Ref 1) (see Fig 1). Tests carried out by the author of this article with T.Yu. Lyubimova and F.M. Ivanov in SoyuzdorNII show that in the initial stages of hardening the presence of belite in cement does not have any effect on the strength of the concrete. Table 1 gives values of strength of concrete tested in compression in relationship to the degree of grinding, as given in the work of L.D. Yershov (Ref 3). Investigations carried out by SoyuzdorNII and NIITsement with wet grinding of cement showed that in the case of various types of cement it is possible to add, instead of clinker, up to 25% of ground lime. During 1937-40 many tests were carried out in various concreting yards, including Volgostroy, with so-called 3-component cement. The results showed that the addition of finely ground sand lowers the strength of the concrete. This is also described in a work by G.M. Rushchuk and L.S. Kogan (Ref 4). It was shown in works by V.N. Yung and

The Manufacture of Rapid-Hardening, Durable and Effective Concretes for Precast Reinforced Concrete Constructions

Yu.M. Butt that the degree of hydration of portland cement is higher when finely ground material is used for the cement. Tests carried out by TsNIIS of Mintransstroy together with VNIIstroydormash show that the important factor in the consolidation of stiff concrete mixes is the equal distribution of amplitude of vibrations along the whole area of the cast product, and that the required frequency of vibration is 3000/7000 per min. Tests carried out by TsNIIS on consolidation of concrete mixes by double frequency vibrator are described. Fig 2 illustrates the relationship between the strength of the concrete and water/cement ratio. Further tests carried out by TsNIIS of Mintransstroy show that concrete mixes with minimal water content have high technical and economic values, but consolidation by vibration of such stiff mixes cannot be carried out satisfactorily due to the inefficiency of the vibrating tables. The VNIIstroydormash designed and constructed a new type of vibrating table, working with 3000/7000 vibrations per min. Table 2 gives values of the increase in strength

The Manufacture of Rapid-Hardening, Durable and Effective Concretes for Precast Reinforced Concrete Constructions

of concretes of various chemical and mineralogical contents, related to varying degrees of grinding. Table 3 gives values for variations in the strength of cement made from the same type of clinker, related to various degrees of grinding.
There are 2 figures, 3 tables and 8 Soviet references.

FEDORKOV, I.A., inzh.; SHESTOPEROV, S.V., doktor tekhn.nauk; KUZNETSOV, P.V., red.; GERASIMOVA, Ye.S., tekhn.red.

[Adhesion of stressed reinforcements to concrete; studying the adhesion of stressed twisted and shaped reinforcements 3, 4, and 5 mm in diameter] Stseplenie napriazhennoi armatury s betonom; issledovaniia stsepleniia napriazhennoi vitoi i profilirovannoi armatury diametrom 3, 4 i 5 millimetrov. Moskva, Gosplanizdat, 1959. 46 p. (MIRA 13:9)

(Reinforced concrete)

ZOLOTARSKIY, Aleksey Fedorovich, kand.tekhn.nauk; SEREBRENNIKOV, Vladimir Vasil'yevich, kand.tekhn.nauk; BERG, Oleg Yanovich, kand.tekhn. nauk; SHESTOPEROV, Sergey Vladimirovich, prof., doktor tekhn.nauk; VERIGO, Mikhail Feliksovich, prof., doktor tekhn.nauk; SOROKIN, N.N., red.; VERINA, G.P., tekhn.red.

[Reinforced concrete ties] Zhelezobetonnye shpaly. Pod red. M.F.Verigo. Moskva, Gos.transp.zhel-dor.izd-vo, 1959. 327 p. (Railroads--Ties, Concrete) (MIRA 12:3)

SHESTOPEROV, S.

Testing the SSB and Vusal admixtures. Tr. from the Russian. p. 405

INZENYRSKE STAVBY. (Ministerstvo stavebnictvi) Praha, Czechoslovakia.
Vol. 7, no. 11, Nov. 1959

Monthly list of East European Accessions (EEAI) LC, vol. 9, no. 1, Jan. 1960

Uncl.

SHESTOPEROV, S.V., doktor tekhn.nauk; IVANOV, G.S., kand.tekhn.nauk;
ANDREYCHENKO, A.V., inzh.

Stand-mixed technique of manufacturing wire-reinforced concrete ties. Transp.stroi. 9 no.1:35-39 Ja '59. (MIRA 12:2)
(Railroads--Ties, Concrete)

SHESTOPEROV, Sergey Vladimirovich; SMIRNOVA, I.A., red.; CHVANOV, V.G., red.izd-va; MAL'KOVA, N.V., tekhn.red.

[Durability of concrete] Dolgovechnost' betona. Izd.2., perer. i dop. Moskva, Nauchno-tekhn.izd-vo M-va avtomobil'nogo transporta i shosseinykh dorog RSFSR, 1960. 512 p. (MIRA 13:9)
(Reinforced concrete)

SHESTOPYOV, V.V., prof., doktor tekhn. nauk; [illegible], L.A., inzh.

Reviewing technical specifications of the state standard for asphalt concrete. Sbor. trud. Khab. avt-dor. inst. no.2:29-34 '62. (MIRA 13:4)

1. Moskovskiy avtomobil'no-dorozhnyy institut.

[illegible], S.V.; [illegible], I.A., red.

[Durability of concrete] Dolgovechnost' betona. [n.p.] Rosvuzizdat, 1963. 46 p. (MIRA 17:6)

1. Moscow. Avtomobil'no-dorozhnyy institut. Otdeleniye usovershenstvovaniya rukovodyashchikh i inzhenerno-tekhnicheskikh rabotnikov.

ZASHCHEPIN, A.N.; SHESTOPEROV, S.V., prof., red.; SMIRNOVA, I.A., red.

[Use of plasticizing and air absorbing additives in cement concrete] Primenenie plastifitsiruiushchikh i vozdukhovovlekaiushchikh dobavok v tsementnom betone. [n.p.] Rosvuzizdat, 1963. 11 p. (MIRA 17:11)

[illegible], V. [illegible] kand. tekhn. nauk; SHESTOPEROV, S.V., [illegible] tekhn. nauk, prof., red.; AKATOVA, V.G., red.

[Curing freshly laid concrete with the aid of film-forming materials] Ukhod za svezheulozhennym betonom s pomoshch'iu plenkoobrazuiushchikh materialov. [n.p.] Rosvuzizdat, 19[illegible]. [illegible] p. (MIRA [illegible])

ZASHCHEPIN, A.N., kand. tekhn. nauk; SHESTOPEROV, S.V., prof., red.; SKIRNOVA, I.A., red.

[Use of chlorides in road concrete] Primenenie khloristykh solei v dorozhnom betone. [n.p.] Rosvuzizdat, 1963. 12 p. (MIRA 17:12)

RADIN, A.M., kats.; SHESTOPEROV, S.V., prof., doktor tekhn. nauk, red., AKATOVA, V.S., red.

[Thermal and steam curing of concrete and reinforced concrete products] Termovlazhnostnaia obrabotka betonnykh i zhelezobetonnykh izdelii. Moskva, Vysshaia shkola, 1964. 23 p. (MIRA 18:5)

SHESTOPEROV, S.V., doktor tekhn.nauk; BAKHRAKH, G.S., inzh.; ZUBETS, V.N., inzh.

Waste dust of cement plants used as a mineral powder for asphalt concrete. Avt.dor. 27 no.11:25-27 N '64.
(MIRA 18:4)

[illegible] prof., doktor tekhn. nauk; [illegible]

[Asphalt concrete [illegible] activated mineral materials] Asfal'tovyy beton [illegible] mineral'nykh materialov. [illegible] (MIRA 18:5)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001549130008-0"

[illegible], red

[Cements and their structural and engineering properties]
Tsementy i ikh stroitel'no-tekhnicheskie svoistva.
Lvov, Vyssheia shkola, 1981. 57 p. (MIRA 18:5)

AUTHORS: Grigorev, N. L., Shestoperov, V. Ya., Sobinyakov, V. A., Podgurskaya, A. V.

TITLE: Interaction of Particles of Energy $1o^{12}$-$1o^{15}$ eV With Light Atomic Nuclei (Vzaimodeystviye s legkimi atomnymi yadrami chastits s energiyey $1o^{12}$-$1o^{15}$ eV)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1957, Vol. 33, Nr 5, pp. 1099-1109 (USSR)

ABSTRACT: The interaction of high energetic particles atomic with the atoms of the air was measured in an outfit consisting of 44 ionization chambers which were arranged in 2 series comprising each 22 superposed chambers. A layer of lead of 2 cm thickness was placed between the two series. A layer of lead of 1o cm thickness was placed upon the upper series. The operational surface of each series embraced approximately o,6 m^2. In addition to the stable arrangement a case containing 1o counters could be brought into 3 measuring positions. Each of these tubes was connected with the hodoscope.
The measurement of the impacts was carried out in 3200 m above sea level. From the probability of the observation of the impacts accompanied by air showers, the range may be considered a measuring index for the interaction of the particles of energy of~$1o^{12}$eV

Card 1/2

AUTHORS: Grigorov, N. L., Shestoperov, V. Ya. SOV/56-34-6-22/51

TITLE: On a Possible Mode of the Development of the Extense Air Showers (Ob odnoy vozmozhnosti razvitiya shirokikh atmosfernykh livney)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 6, pp. 1539-1547 (USSR)

ABSTRACT: The authors make the following assumptions: The particles with high energies ($E_o \sim 10^{13} - 10^{14}$ eV) which generate the extensive air showers have the absorption range (probeg pogloshcheniya) $L_{absorption} = 120$ g/cm^2. The interaction of the particles with extremely high energies may be subdivided into two classes: interactions with low and with high (nearly 100%) energy losses. The weak interactions are not taken into account. The authors investigate two simplified schemes of the great energy losses: a) The whole of the lost energy passes over to one photon with the energy E_o (E_o denotes the energy of the primary nuclear-active particle) and then the shower is generated as an electron-

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On a Possible Mode of the Development of the Extense Air Showers

photon shower without participation of nuclear-active particles. b) The collision with a 100% energy loss corresponds to an act investigated by Landau (Ref 6) and then the shower is generated on account of the influence of the nuclear-active particles on its generation. The energy spectrum may have the form $F(E)dE = BdE/E^{2,7}$. This paper calculates on the basis of these assumptions the average characteristics of the extensive air showers (which are experimentally observed). The parts of this paper deal with the height dependence of the number of showers with a given number of particles and with the spectrum of the showers with respect to the particle number, with the barometric effect of the extensive air showers, with the energy spectrum of the primary particles which generate extensive air showers with a given number of particles, and with the spatial distribution of the particles in the extensive air showers. The interactions of the primary particles which correspond to great energy losses and seem to be responsible for the generation of the extensive air showers may not be always the same ones. Moreover, the characteristic properties of these interactions may vary very much.

SOV/56-34-6-22/51

On a Possible Mode of the Development of the Extense Air Showers

There are 7 figures, 5 tables, and 12 references, 9 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: December 30, 1957

Card 3/3

SHESTOPEROV, V. YA.

STUDIES OF LARGE IONIZATION BURSTS BY THE METHOD OF "CONTROLLED PHOTOGRAPHIC EMULSIONS"

S.I. Brikker, N.L. Grigorov, M.A. Kondratyeva, A.V. Produrskaya, A.I. Savelieva, V.Ya. Shestoperov

I. Electron-sensitive protographic plates were irradiated at 3200 m. above sea level in a special apparatus, which a recorded large ioniation burst with the number of particles 1000, and b) indicated through which of the photographic plates (covering the entire sensitive area of the apparatus) the shower has passed that produced the given "burst".

2. The analysis showed that:

(A) the majority of "bursts" are created by showers of electrons generated in the apparatus by nuclear-active particles of high-energy.

(b) the showers most often consist of one principal "core" apparently created by a single gamma-quantum of sufficiently high energy;

(c) in cases when the shower contains several laterally separated "cores" one of the "core" is, as a rule, responsible for the buld of the particles in the shower, that is, in the recorded ionization "burst"

(d) if in showers that contain two or more "core", the total energy of the whole shower is taken as unity, the energy distribution of the individual showers comprising the given shower may be approximated by a power function

Report presented at the International Cosmic Ray Conference, Moscow, 6-11 July 1959

SHESTOPEROV, V. YA.

CONCERNING A CERTAIN POSSIBILITY FOR THE DEVELOPMENT OF EXTENSIVE AIR SHOWERS

N. L. Grigorov, V. Ya. Shestoperov

1. In a number of recent studies it is shown that the characteristics of the elementary act with the energy of the primary particle $\sim 10^{12}$ ev and higher may vary considerably and the coefficient of inelasticity may vary throughout a very great range. For example, cases have been observed when almost the entire energy of the primary particle was transferred to π -mesons. If one assumes that interactions at higher energies are likewise characterized by great fluctuations in the proportion of energy lost, it is possible to explain the principle characteristics of extensive air showers.

2. To simplify calculations it is assumed that the interactions of ultra-high energy particles may be divided into two classes: the class of small energy losses (which we shall ignore) and the class of great energy losses (close to 100%). We consider two simplified schemes of great energy loss: a) the entire energy lost is transferred to a single photon, b) collision with a great of energy loss corresponds to the act considered by Landau.

Report presenred at the International Cosmic Ray Conference, Moscow, 6-11July 1959

GRIGOROV, N.L.; SHESTOPEROV, V.Ya.

Some characteristics of interactions of $E \geqslant 2.10^{12}$ eV particles with light nuclei. Zhur.eksp.i teor.fiz. 37 no.4:1147-1149 O '59. (MIRA 13:5)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.
(Nuclear reactions)

SHESTOPEROV, V. YA.

S/058/61/000/010/016/100
A001/A101

3.2410

AUTHORS: Grigorov, N.L., Kondrat'yeva, M.A., Savel'yeva, A.I., Sobinyakov, V.A., Podgurskaya, A.V., Shestoperov, V.Ya.

TITLE: Methods of studying the elementary process of interaction with atomic nuclei of nuclear-active particles with energies of 10^{11}-10^{14} ev developed at the Moscow University

PERIODICAL: Referativnyy zhurnal. Fizika, no. 10, 1961, 96, abstract 10B499 ("Tr. Mezhdunar. konferentsii po kosmich. lucham, 1959, v. 1", Moscow, AN SSSR, 1960, 122 - 133)

TEXT: The authors describe the devices of the Cosmic Radiation Laboratory at the MGU for studying the elementary process of interaction with atomic nuclei of nuclear-active particles with energies of 10^{11} - 10^{14} ev (with the use of a large number of counters, ionization calorimeters, systems of controlled photoplates).

[Abstracter's note: Complete translation]

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CHUDAKOV, V. Ya.

Cand Phys-Math Sci - (diss) "Study of interaction of particles with atomic nuclei at energies of $10^{11} - 10^{13}$ ev." Moscow, 1961. 12 pp; (Inst of Chemical Physics of the Academy of Sciences USSR); 200 copies; free; bibliography at end of text (15 entries); (KL, 5-61 sup, 174)

[illegible], V. YA., [illegible], K. I., [illegible], Z. A., [illegible], Y. I.,

[illegible], S. A., Grigorov, N. L., Bayadjan, N. Y., Babecki, V. S.,

Loskevicz, J., Dlis, A., Murzin, V. S.

"Mountain-Altitude Studies of the Interaction of High-Energy Particles with Atomic Nuclei".

report submitted for the Intl. Conf. on Cosmic Rays and Earth Storm (IUPAP) Kyoto, Japan 4-15 Sept. 1961.

SHESTOPEROV, V Ya

25191
S/056/61/040/006/002/031
B102/B214

3.2410

AUTHORS: Babetski, S. Ya., Buya, Z. A., Grigorov, N. L., Loskevich, Ye. S., Massal'skiy Ye. I., Oles', A. A., Shestoperov, V. Ya.

TITLE: Investigation of large ionization bursts caused by cosmic ray particles at sea level

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 6, 1961, 1551 - 1561

TEXT: The authors investigated particle interactions for energies of 10^{12}-10^{13} ev using photoemulsions. The reports on the measurements are presented in this paper. The experimental arrangement consisted of 128 ionization chambers (total area 10 m^2), which together with a combined lead graphite filter formed a so-called ionization calorimeter which also made the determination of shower coordinates possible. This apparatus was set up on Mount Aragats at a height of 3200 m (a simpler variety of this device was used in Moscow earlier, 50 m above sea level). Fig. 1 shows the arrangement of the layers and cylindrical ionization chambers (I-IV) above and below the graphite layer (density 60 g/cm^2). The apparatus was placed in a special

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building and covered on the top by light materials only (2 g/cm^2). All the amplifiers were calibrated by radiotechnical means twice a day. The amplification factor was found in general not to vary more than 2 - 3 % in the course of a day. During the first half period of the measurements in series I of chambers the frequency of the bursts of a size of J_1 = 1200 relativistic particles was $(1.27 \pm 0.03)\cdot10^{-1}$/hr·m^2; in the second half period it was $(1.25 \pm 0.03)\cdot10^{-1}$/hr·m^2. Measurements carried out for 2640 hours with the chambers placed below the graphite layer showed that the electron and photon showers recorded were produced inside the apparatus. The intensity ratio for the two series for a shower with particles numbering $(1.2 - 2.4)\cdot10^3$ was $\overline{(J_1/J_2)} = 1.5 \pm 0.1$; for showers with number of particles $>1.2\cdot10^4$ this ratio was 3.4 ± 0.8. These showers could have been produced in the apparatus by the interaction of the high energy particles of nuclear kind in the graphite, or by the electromagnetic interaction of high energy muons in the filter. The spectrum of the ionization bursts was determined from the total ionization recorded in all the chambers (for the bursts considered) separately for the first and the second series. If the observed distribu-

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tion is represented in the form of an exponential law $N(\geq J) = AJ^{-\gamma}$, for the first series is 1.71 ± 0.04 and for the second 2.00 ± 0.04. These results agree well with those of other authors. Part of the showers were distinguished by a strong nonmonotonous ionization distribution in the series I and II (ionization in the individual chambers, very weak or no ionization in the neighboring chambers). These were designated as "structural" bursts. Numerical data on these are given in Table 1. The average distance l between the chambers, recording maximum ionization, were also determined for this kind of bursts. The results are given in Table 2. The spectrum of these bursts may be represented by $N(\geq J) = BJ^{-\gamma}$, where $\gamma = 1.96 \pm 0.03$. The results are discussed in the following, and an attempt has been made to determine the course of the bursts in altitude by theoretical considerations. This is done under special assumptions about the properties of the participating pions and the spectrum of the primary particles. The nature of large ionization bursts is also discussed. The authors thank Diploma Student V. Trush for collaboration. Ye. A. Murzina, S. I. Nikol'skiy, and V. I. Yakovlev are mentioned. There are 4 figures, 2 tabels and 12 references: 11 Soviet-bloc and 1 non-Soviet-bloc.

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25191
S/056/61/040/006/002/031
B102/B214

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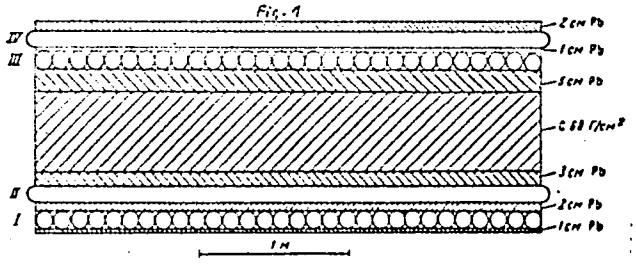
ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: December 20, 1960

Fig. 1



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26407
S/056/61/041/001/002/021
B102/B212

3,2410 also 2412

AUTHORS: Babetski, Ya. S., Buya, Z. A., Grigorov, N. L., Loskevich, Ye. S., Massal'skiy, Ye. I., Oles', A. A., Shestoperov, V. Ya., Fisher, S.

TITLE: Nuclear-active particles in atmospheric showers

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 1 (7), 1961, 13 - 21

TEXT: The aim of the present paper has been to contribute to the clarification of the characteristics of elementary processes underlying the formation of an extensive air shower and also of the role played by the nuclear-active component in shower formation. A number of shower parameters have been determined (the energy E_{e-ph} of the electron-photon component, the energy transferred by π^0 mesons, and the ionizations I in the chamber rows) by employing an arrangement which has been described earlier by the authors (Ref. 4: ZhETF, 40, 1551, 1961). It consists of 126 ionization chambers (active area, 10 m^2). [Abstracter's note: In order to follow the

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statements, a knowledge of Ref. 4 is required.] The measurements were made at sea level for both extensive and "young" atmospheric showers. Of all extensive atmospheric showers recorded, those with $J_{3,4} \geq 1.2 \cdot 10^4$ relativistic particles (i. e., $E_{e\text{-}ph} \gtrsim 2 \cdot 10^{12}$ ev) have been selected. 264 such showers had been found after 1842 hours of measuring. (The ionization chambers were arranged in four rows; $E_{\pi^0}/E_{e\text{-}ph} = J_{1,2}/J_{3,4}$ could be set in good approximation). A determination of the position of the axes of these extensive atmospheric showers showed that in about half of all cases the shower axis hit the instrument and in all other cases the axis was found nearby. It can thus be assumed that the mean value $E_{\pi^0}/E_{e\text{-}ph}$ measured refers to the central region of the shower. The selected showers with $J_{3,4} \geq 1.2 \cdot 10^4$ had a number of particles amounting to $\gtrsim 10^5$, and $(J_{1,2}/J_{3,4} = 0.130 \pm 0.047$ was obtained for them. For showers whose axes did hit the measuring arrangement this ratio was equal to 0.125 ± 0.036. Assuming that the ionization by nuclear-active particles was not a function of the location of the chamber in the arrangement, then it follows that the

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electron-photon component in row I increases the ionization by 30±7.5%. From this it follows that $(\Sigma_{\pi^0}/\Sigma_{e\text{-}ph}) = 0.091 \pm 0.031$; if the angular distribution in an extensive atmospheric shower is taken into account, one obtains 0.097 ± 0.036. Table 2 shows the ionization ratios for various shower groups. Special investigations which have been made for "young" atmospheric showers (1900 hours, 52 "young" atmospheric showers with $J_{3,4} \geq 1.2 \cdot 10^4$ relativistic particles) yielded the following results: The intensity of these showers "young" atmospheric showers was equal to $0.95 \pm 0.13) \cdot 10^{-10}$ cm^{-2} sec^{-1}, and the energy of the electron-photon component was not less than $2 \cdot 10^{12}$ ev. The ionization in the third chamber row was always 1.5 - 2 times higher than that in the fourth row. The intensity of individual showers ($J_2 \geq 1.2 \cdot 10^4$) measured in the second row was equal to $2 \cdot 10^{-11}$ cm^{-2} sec^{-1}. The J_3 or $E_{e\text{-}ph}$ distribution of the "young" showers can be described by $N(\geq J_3) = AJ_3^{-\gamma}$, where $\gamma = 1.5 \pm 0.4$. Some cases have been found with $E_{e\text{-}ph} \geq 10^{13}$ ev. These "young" showers

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P/046/62/007/002/001/003
D256/D302

AUTHORS: Grigorov, N.L., Tretyakova, Ch.A., Shestoperov, V.I., Babyan, Kh.P., Bayadzhyan, N.G., Buja, Z., Łoskiewicz, J., Massalski, J., and Oleś, A.

TITLE: Integral spectrum of ionization pulses caused by nuclear active particles of cosmic radiation at mountain altitudes

PERIODICAL: Nukleonika, v. 7, no. 2, 1962, 61 - 73

TEXT: The investigation was conducted in order to obtain information concerning: 1) The pulse spectrum and its dependence upon the dimensions of the apparatus, 2) the altitude dependence of the frequency of the registered pulses, 3) the mechanism of local generation of π^0 mesons by nuclear active particles. The apparatus covered an area of 10 m^2 and it consisted of 6 horizontal trays of 33 ionization chambers each, the trays being separated by graphite and lead absorbers, arranged to enable detection of electromagnetic cascades created by the decay products of π^0 mesons and evaluation

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investigation of the influence of the dimensions of the apparatus used upon the ionization spectra. The dependence of the percentage of the structural pulses upon the registered pulse height was examined, showing that the percentage of the structural pulses is a monotonic function increasing with the increase of the total pulse height registered i.e. with increasing the total energy. In order to assess the role of μ mesons, the altitude dependence was investigated of generating pulses of different nature. The integral spectra were found to be exponential: $N = AI^{-\gamma}$ in the region of pulse heights from 10^3 to 10^5 particles. The following conclusions were derived from the analysis of the experimental results: 1) The spectra induced by nuclear active particles depend essentially on the dimensions of the apparatus and on the pulse heights. The exponent γ of the integral spectrum for pulse heights (measured in numbers of particles) ranging from 2×10^3 to 2×10^5 particles changes from $\gamma = 1.41$ to $\gamma = 2.00$ for the area of the apparatus changing from 330×330 cm^2 to 10×330 cm^2 respectively. 2) At mountain altitudes the exponent γ of the integral spectrum for single nuclear active particles was determined to be $\gamma = 2.01 \pm 0.08$ for $3 \times$

SHESTOPEROV, V. YA.

3.3410 (2205, 1705, 2805)

S/048/62/026/005/002/022
B102/B104

AUTHORS: Babayan, Kh. P., Babetski, Ya. S., Boyadzhyan, N. G., Buya, Z. A., Grigorov, N. L., Loskevich, Ye. S., Mamidzhanyan, E. A., Massal'skiy, Ye. I., Oles', A. A., Tret'yakova, Ch. A., and Shestoperov, V. Ya.

TITLE: Investigation of the interaction of high-energy particles with atomic nuclei on mountains

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 5, 1962, 558 - 571

TEXT: Ionization bursts caused by the electron-photon component of a shower of cosmic-ray particles were studied with an array of ionization chambers (Fig. 1) at the mountain station (3200 m) of the Akademiya nauk Armyanskoy SSR (Academy of Sciences Armyanskaya SSR). The array consisted of six rows of ionization chambers separated by layers of lead and graphite, and covered an area of 10 m^2. Owing to this large area, heavy bursts with a total energy of locally generated π^0 mesons amounting to $\sim 10^{13}$ ev could be photographed. The data obtained were analyzed for

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ionization bursts in the filter of the arrangement, for the altitude dependence of the burst frequency, and for the burst spectrum and its dependence on the size of the arrangement; the mechanism of local π^0 generation by single nuclear-active particles was investigated. The bursts observed were grouped according to their intensity I, i.e., according to the number of relativistic particles involved; for each group, the numbers of ionization and "structuralized" bursts were determined for rows I-IV. The spectrum of ionization bursts can be described by $N(>I) = AI^{-\gamma}$ for all chambers. The index of the integral spectrum for $2 \cdot 10^3 \leq I \leq 2 \cdot 10^5$ equals 1.37 ± 0.02. With an area of ~0.6 m^2 it was found that ~20% of the bursts were "structuralized" for $1 \cdot 10^3 \leq I \leq 5 \cdot 10^3$. At $I > 1 \cdot 10^4$ and 10 m^2 50% of the bursts (at sea level) and 75% (on the mountains) have a structure. An analysis of the course of the bursts with the altitude has shown that: (1) the integral spectrum of muon-induced bursts with $3 \cdot 10^3$ - $3 \cdot 10^4$ particles has an exponent of $\gamma = 2.22 \pm 0.14$; (2) for a burst of equal intensity, induced by a single nuclear-active particle, $\gamma = 1.98 \pm 0.09$; (3) at 3200 m, the muon contribution to single heavy bursts is small (15% of all bursts with ~10^3 particles, and ~4% of those with ~$2 \cdot 10^4$ particles;

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(4) at sea level, the muon contribution is ~70% (~10^3 particles) and ~50% (~$2 \cdot 10^4$ particles). The burst spectrum was found to depend greatly on the area of the measuring arrangement. With $2 \cdot 10^3$ - $2 \cdot 10^5$ particles, γ goes over from 1.37 ± 0.02 for $(330\ cm)^2$ to 1.99 ± 0.05 for $10 \cdot 330\ cm^2$. The spectrum of bursts with a π^0 energy transfer of $3 \cdot 10^{11}$ - 10^{13} ev agrees with that of nuclear-active particles, and exhibits no "breaks". When particles with $E > 10^{12}$ ev interact with light nuclei in about 10% of the events, the interaction is completely inelastic, and the π^0 energy transfer amounts to 60 - 60% of the primary-particle energy. Such interactions obviously play a significant role in the formation of extensive air showers with at least 10^4 - 10^5 particles. There are 8 figures and 7 tables.

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S/056/62/042/004/023/037
B108/B102

AUTHORS: Tret'yakova, Ch. A., Shestoperov, V. Ya.

TITLE: Fluctuations in the distribution of extensive atmospheric shower particles

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 4, 1962, 1061 - 1062

TEXT: Following earlier work (ZhETF, 34, 1539, 1958), the authors calculated the particle distribution in showers consisting of 10^5, 10^6, and 10^7 particles as a function of the cascade parameter S. The calculations were carried out for atmospheric depths of 1000 g/cm^2 (sea level) and 640 g/cm^2. Fluctuations in the particle distribution were found to decrease with increasing altitude and shower intensity. There are 2 figures and 3 Soviet references.

Card 1/2

. . MAYAN, S. I. BRIKKER, N. L. GRIGOROV, A. V. PODGURSKAYA,
. . SAVELYEVA, V. Ya. SHESTOPEROV

...estigation of Nuclear Interaction at 10^{13} ev by means of "Controlled" Photoemulsions Method

...ort submitted for the 8th Intl. Conf. on Cosmic Rays (IUPAP), Jaipur India, ... Dec 1963

, N. L.; SHESTOPEROV, V. Ya.

The Role of the Fluctuation of the Interaction Characteristics in Fundamental Processes Observed in Cosmic Rays at High Energies

Report submitted for the 8th Intl. Conf. on Cosmic Rays (IUPAP), Jaipur, India, 2-14 Dec 1963

GRIGOROV, N.L.; TRETYAKOVA, C.A.; SHESTOPEROV, V.Ya.; BABAYAN, C.P.; BOYADSYAN, N.G.; MASSALSKI, J.; NIZIOL.B.; OLES,A.

Integral spectrum of nuclear active particles at mountain altitudes from the investigation of high ionization pulses. Acta physica Pol 24 no.3:357-371 S'63.

1. Institute of Nuclear Physics, University, Moscow (for Grigorov, Tretyakova, Shestoperov). 2. Institute of Nuclear Physics, Armenian Academy of Sciences, Erevan (for Babayan, Boyadsyan). 3. Institute of Nuclear Research, Laboratory of High Energy Physics, Krakow, and II Department of Physics, Academy of Mining and Metallurgy, Krakow (for Massalski, Niziol and Oles).

45360
S/056/63/044/001/005/067
B108/B180

3.2430

AUTHORS: Babayan, Kh. P., Boyadzhyan, N. G. Grigorov, N. L., Tret'yakova, Ch. A., Shestoperov, V. Ya.

TITLE: Large ionization bursts and the spectrum of the nuclear-active particles on mountains

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 1, 1963, 22 - 34

TEXT: There are considerable discrepancies in the experimental values of the power exponent of $\Psi(n)dn = Ac\frac{dn}{n^{\gamma+1}}$ the integral spectrum of the bursts as determined by various investigators. The present authors studied large ionization bursts at an altitude of 3200 m above sea level with an arrangement of 92 ionization chambers covering an overall area of 10 m^2. The results showed that a considerable part of the ionization bursts are caused by nuclear-active particles falling simultaneously on to the measuring apparatus. With a large apparatus the bursts spectrum may be very different from that of the single nuclear-active particles. This is due to the

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incidence of a group of particles ("structurized" bursts) (N. L. Grigorov et al. ZhETF, 33, 5, 1099, 1957). In the apparatus used in this investigation, a γ of 1.38 $\pm$ 0.03 was recorded for the simultaneous incidence of particle groups, while that for individual particles was 1.92 $\pm$ 0.05. There are 6 figures and 3 tables.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: June 27, 1962

BABAYAN, Kh. P.; BOYADZHYAN, N.G.; GRIGOROV, N.L.; MAMIDZHANIAN, E.A.; TRET'YAKOVA, Ch.A.; SHESTOPEROV, V.Ya.

Energy spectrum of nuclear-active particles in extensive air showers. Zhur. eksp. i teor. fiz. 45 no.3:418-427 S '63. (MIRA 16:10)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta i Fizicheskiy institut Akademii nauk Armyanskoy SSR.
(Cosmic rays)

GRIGOROV, N.L., KHRISTOVSKIY, V.G.

Role of fluctuations in the interaction characteristics of nuclear-active particles in a number of processes observed in cosmic rays at high energies. Izv. AN SSSR. Ser. fiz. 28 no.11:1778-1783 N '64. (MIRA 17:12

1. Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.

BARASH, Kh.P., [illegible], Yu.I., GRIGOROV, N.L., PODGORETSKAYA, A.V., SAVEL'YEV, [illegible], SHESTOPEROV, V.Ya.

Generation of π^- mesons at particle energies of $5 \cdot 10^{12}$ to $[illegible]^{13}$ ev. Izv. AN SSSR. Ser. fiz. 28 no.11:1784-1789 N '64. (MIRA 17:12)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova i Institut fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

S/0252/64/038/001/0009/0015

ACCESSION NR: AP4026380

AUTHORS: Babayan, Kh. P.; Grigorov, N. L.; Mamidzhanyan, E. A.; Shestoperov, V. Ya.

TITLE: Interaction of nuclear-active high-energy particles with light-atomic weight nuclei, characterized by high degree of inelasticity (Presented by corresponding-member G. M. Garibyan of the Academy of Science, Armenian SSR)

SOURCE: AN ArmSSR. Doklady*, v. 38, no. 1, 1964, 9-15

TOPIC TAGS: electron-photon atmospheric shower, ionization chamber, π^0-meson, nuclear-active particles, inelastic interaction

ABSTRACT: The so-called "new electron-photon atmospheric showers" (NAS) have been studied at a 3200-m altitude above sea level. The equipment was spread over an area of 20 m^2 and consisted of 6 ionization chambers, lead and graphite separation filters, and two upper series chambers for measuring the electron-photon component of NAS. It is assumed that "new showers" are generated during interactions where a certain number of π^0-mesons ($\leqslant 4$) transmit the greater part of

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ACCESSION NR: AP4026380

their energy to primary nuclear-active particles. The investigation of nuclear-active components of NAS indicates that at $E_o \geq 1.7 \times 10^{12}$ ev nuclear-active particle energies there exists (with $0.11 \leq w \leq 0.27$ probability) an almost fully inelastic ($K \approx 1$) interaction with light-atomic weight nuclei 70% π^o - meson energy transfer (to "primary" particles) in a single event. These interactions introduce more than a 45% contribution to the energy loss in π^o - meson formation. Orig. art. has: 4 figures and 1 formula.

ASSOCIATION: Yerevanskiy institut fiziki GKAE (Yerevan Institute of Physics); [illegible] YGU; Yerevanskiy gosudarstvennyy universitet (Yerevan State University)

SUBMITTED: 00 DATE ACQ: 16Apr64 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 000

Card 1/2

ACCESSION NR: AP4033062 S/0252/64/038/002/0101/0104

AUTHORS: Babayan, Kh. P.; Grigorov, N. L.; Mamidzhanyan, E. A.; Shestoperov, V. Ya.

TITLE: The height behavior of nucleons of high energy in the atmosphere (Presented by M. L. Ter-Mikayelyan, corresponding member of the AN Armyanskoy SSR on 25 September 1963)

SOURCE: AN ArmSSR. Doklady*, v. 38, no. 2, 1964, 101-104

TOPIC TAGS: nucleon, atmosphere, attenuation length, mu meson, interaction range

ABSTRACT: When a nucleon of high energy interacts with a substance, the definite attenuation length of the nucleon in the substance has an intrinsic value. This paper is devoted to a determination of this value in the atmosphere. Computations show that deep in the atmosphere the attenuation length of nuclear-active components is determined only by the absorption of nucleon components. The authors have used the height behavior of young atmospheric showers for this purpose. Measurements were made at heights of 200 and 3250 m. The detecting apparatus had a working area of 10 m^2 and consisted of six series of ionization chambers, each 330 cm long and

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ACCESSION NR: AP4033062

10 cm in diameter. The fifth and sixth series were placed beneath a lead shield. It was found that the frequency of the young showers increased by a factor of 14-16 from sea level to the mountain top. This indicates that μ-mesons play an insignificant role in the formation of young showers. The contribution of μ-mesons in these events at a height of 3250 m does not exceed 1% of the total of the young shower. At sea level, the contribution may reach 15%. The attenuation length in the lower layers of the atmosphere of nucleons with energies of $E \geq 2 \cdot 10^{12}$ ev is 109 ± 8 g/cm^2. When the interaction range of nucleons in the atmosphere is 80 g/cm^2, an attenuation length of 109 g/cm^2 corresponds to an average inelasticity coefficient of the nucleons of $\bar{K} = 0.5$. When the interaction range is 90 g /cm^2, $\bar{K} = 0.6$. Orig. art. has: 3 formulas.

ASSOCIATION: Institut fiziki GKAE (Yerevan) NIIYaF; MGU (Institute of Physics GKAE (Yerevan) NIIYaF, MGU); Yerevanskiy gosudarstvenny*y universitet(Yerevan State University)

SUBMITTED: 00 DATE ACQ: 07May64 ENCL: 00

SUB CODE: ES, GP NO REF SOV: 003 OTHER: 000

Card 2/2

BABAYAN, Kh.P.; BRYADZHYAN, N.G.; MAMIDZHANYAN, E.A.; GRIGOROV, N.L.; TRET'YAKOVA, Ch.A.; SHESTOPEROV, V.Ya.

Nuclear-active particles in young air showers. Zhur. eksper. i teor. fiz. 46 no.1:110-122 Ja'64. (MIRA 17:2)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta i Institut fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR, Yerevan.